Roquelaure Y, Ha C, et al. Risk Factors for Upper Extremity Musculoskeletal Disorders [UEMSD] in the Working Population. Arthritis Rheum 2009;61(10):1425-1434.

Design: Cross-sectional study

Population/sample size/setting:

- 3710 workers (2162 men, 1548 women, mean age 38) undergoing mandatory annual health examinations in the Loire valley in France between April 2002 and April 2005
- Standardized physical exams by occupational physicians were done to detect UEMSD incorporating several diagnoses: rotator cuff syndrome, lateral epicondylitis, ulnar tunnel syndrome, carpal tunnel syndrome, deQuervain's disease, and flexor-extensor peritindinitis or tenosynovitis of the forearm-wrist region
- Self-administered questionnaires were given to the workers to gather information on job characteristics, work organization, and risk factors derived from a European consensus document published in 2001 (such as posture, force, movement, vibration, and psychological factors at work)

Main outcome measures:

- Any UEMSD was considered to be a case; if the disorder was bilateral, the subject counted as only one case
- The associations between risk factors and UEMSD were analyzed in several stages, beginning with simple univariate associations and progressing to multivariable logistic regression models
- In all of the analyses, risk factors for men and women were examined separately
- For both sexes, a prior history of UEMSD was strongly related to having a current UEMSD; the odds ratio was 3.1 for men and 5.0 for women
- Age was associated with UEMSD in both sexes as well; age over 50 had more than three times the risk compared to age under 30
- For men, obesity doubled the odds ratio for UEMSD, but this was not significant for women
- For women but not for men, diabetes increased the odds of UEMSD (OR=4.9)
- Occupational factors had some differences for women and men
- For men, high physical demand, high repetitiveness, working with arms at or above shoulder level, using full elbow flexion/extension movements, and high psychological demand were associated with UEMSD
- For women, wrist bending in extreme postures, use of vibrating hand tools, and low level of decision authority were associated with UEMSD
- Computer use and keyboard use was not associated with UEMSD in either sex
- Most of the odds ratios for work factors and UEMSD were modest (between 1.5 and 2.0)

- For both sexes, rotator cuff syndrome was the most common diagnosis, carpal tunnel syndrome the second most common, and lateral epicondylitis the third most common condition

Authors' conclusions:

- Personal factors (age and past history of UEMSD) were relatively more important in predicting current UEMSD than were work-related exposures
- Because the study was cross-sectional, the history of UEMSD may represent current UEMSD in many workers; if this is the case, the importance of a history of UEMSD may have been inflated
- The physical factors of repetition, physically demanding work, having arms above shoulder level, and wrist bending are associated with UEMSD
- Work organizational factors and stress were inconsistently associated with UEMSD, but may be associated with nonspecific disorders involving regional upper extremity symptoms

Comments:

- The largest group of affected workers had rotator cuff syndrome, which reduces the power of the study to give precise odds ratios for the specific forearm and wrist diagnoses involved in a cumulative trauma guideline
- Self-report of exposure and cross-sectional design impose their usual limits on the causal interpretation of the findings; in particular, the RPE Borg Scale in Tables 1 and 4 gives an individual's perception of the intensity of exertion, but is not a metric expressed in terms of loads and forces
- Many of the exposures are given as positive if occurring 2 hours per day or more; this gives a wide range (2 to 8 hours) of exposure as a single term
- It is not clear why combinations of factors were not entered into Tables 1 and 4 to test for an additive effect of the constituent variables

Assessment: Adequate for a qualitative evidence statement that repetition, physically demanding work, working above shoulder level, and wrist bending are associated with UEMSD